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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,909	02/11/2004	Louis R. Degenaro	YOR919990064US2 (8728-258)	3057

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EXAMINER

CHOI, WOO H

ART UNIT	PAPER NUMBER
2186	

DATE MAILED: 12/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/776,909

Applicant(s)

DEGENARO ET AL.

Examiner

Woo H. Choi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The cross-reference section of the specification should be updated to reflect the current status of the parent application.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1 – 3, 5, 8 – 11, 14, 18 – 20, 22, 25 – 28, 31, 42 and 46 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The language of the claim raises a question as to whether the claims is directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 – 45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

All of the independent claims recite the limitation “**may** affect a desirability”. The limitation implies that the analysis step alternatively determines if there is at least one statement that **may not** affect the desirability of performing at least one cache transaction. It is not clear as to whether and/or how the next step of determining the desirability is to be applied when the analysis step determines that there is at least one statement that does not affect the desirability of performing at least one cache transaction.

For the purposes of this examination, since the claim does not require that the analysis step determine a statement that actually affect the desirability of caching, the determining step, that seems to depend on determining a statement that affects the desirability, will be treated as an optional step. Therefore, there is no requirement to perform this step.

All of the dependent claims are rejected for including the deficiency of the parent claims discussed above.

6. Claims 43, 44, 47 and 48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 43 and 47 require a step of caching a value of a cacheable entity a probability that at least one statement will execute is less than or equal to a threshold. Claims 44 and 48 require a step of invalidating or updating the value of the cacheable

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entity when the probability is greater than or equal to a threshold. The two requirements seem to be in conflict with each other when the probability is equal to a threshold.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1 – 48 are rejected under the judicially created doctrine of double patenting over claims 1 - 37 of U. S. Patent No. 6,725,333 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: Independent claims 1, 18, and 35 are anticipated by patented claims 1, 17, and 33. Dependent claims are anticipated by either the independent or the dependent claims of the patent.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application

which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968).
See also MPEP § 804.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless—

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1 – 8, 10, 14 – 25, 27, 31 – 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Cytron *et al.* (Automatic Management of Programmable Caches, Proceedings of the 1988 International Conference on Parallel Processing, 1988, pp. 75 – 84).

11. With respect to claims 1, 41, 4, 5, 6, 8 18, 45, 21, 23, 25, 35, 38, 39, 40, 41 and 45, Cytron discloses a system for managing a plurality of cachable entities, comprising:

a program analyzer (page 228, right column, second paragraph) to analyze program code and determine if there is at least one statement which may affect a desirability of performing at least one cache transaction (page 231, 2.0 Algorithms, the algorithm analyzes a program to determine cacheability of variables, see page 230, left hand column, 1.1 Software-Controlled Caches for definition of cacheability or degree of desirability of caching, see also page 232, 2.2

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Posting Values to Global Memory, Cyclon discloses a program code sequence that should cause, i.e. highly desirable, a posting of a cached value, i.e. cache transaction);

the program analyzer determining the desirability of performing the at least one cache transaction based on a probability that the at least one statement will execute (figure 4, the probability of executing a $\text{Write}(P_i, X) \rightarrow \text{Read}(P_j, X)$ pattern in a DO loop shown in figure 4 is 1, and the analyzer determines the desirability by augmenting the code with a POST operation code); and

a cache manager for performing the at least one cache transaction if it is determined to be desirable (this is accomplished when the augmented program in figure 4 is executed).

12. With respect to claims 2, 19 and 36, the desirability of performing the at least one cache transaction is based on one of a frequency of access of at least one cachable entity, a size of at least one cachable entity, a time to one of fetch and materialize at least one cachable entity, a lifetime of at least one cachable entity (cacheability is determined based on an expected lifetime, for example, expected lifetime for a non-cacheable entity is zero and expected lifetime for a cacheable entity is greater than a temporary cacheable entity), and a combination thereof.

13. With respect to claim 3, 20, and 37, wherein the at least one statement is a statement that modifies a value of at least one cachable entity (a write statement modifies a value the variable being written), and wherein the desirability is based on an expected lifetime of the at least one cachable entity (see the rejection of claim 2 above).

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14. With respect to claims 7 and 21, at least one of the step of invalidating the at least one cachable entity stored in the cache and the step of updating the at least one cachable entity stored in the cache comprise the step of performing data update propagation (DUP) (figure 4, updated $X(j)$ is propagated to the next iteration, see also figure 3, a cached value from one processor is updated and propagated to another processor).

15. With respect to claims 10 and 27, the cachable entities include query results (a processor querying the cache for a data item reads on this claim).

16. With respect to claims 14, 15, 31 and 32, the at least one statement is a type that one of creates at least one cachable entity, deletes at least one cachable entity, and modifies a value of at least one cachable entity (figure 4), wherein the analyzing step comprises the steps of:

generating an invalidation key format in accordance with the type of the at least one statement (figure 5); and

augmenting the program code with additional code for calculating an invalidation key in accordance with the generated invalidation key format (figure 5).

17. With respect to claims 16 and 33, wherein the step of invalidating at least one cachable entity comprises one of purging the cachable entity from the cache, purging the cachable entity from the cache and repopulating the cache, and updating the cache (page 232, 2.3 Invalidating Cache, see also page 233, 2.4 Flush).

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18. With respect to claims 17 and 34, the step of performing at least one cache transaction comprises the step of initializing a cache (Cytron disclose a software controlled cache which must be initialized and populated to function properly, initial entries of values meet the limitations of this claim).

19. With respect to claims 42 and 46, Cytron discloses determining said probability based on likelihood of a value of a cachable entity changing (a write statement changes the value of X, see figure 4).

20. With respect to claims 43, 44, 47, and 48, the values are cached, posted and invalidated regardless of the threshold value, therefore, they are cached and invalidated if the probability is less than a threshold and they are cached and invalidated if the probability is greater than a threshold. See page 232.

21. Claims 1, 2, 4 – 6, 8, 18, 19, 21, 23, 25, 35, 36, 38 – 41, and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Dubey (US Patent No. 5,774,685).

22. With respect to claims 1, 41, 4, 5, 6, 8, 18, 45, 21, 23, 25, 35, 38, 39, 40, 41, and 45, Dubey discloses a system for managing a plurality of cachable entities, comprising:

a program analyzer to analyze program code and determine if there is at least one statement which may affect a desirability of performing at least one cache transaction (col. 3, lines 58 – col. 4, line 4);

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the program analyzer determining the desirability of performing the at least one cache transaction based on a probability that the at least one statement will execute (col. 4, lines 31 – 44, the compiler determines the desirability of prefetching data based on a speculation that the prefetched data will actually be needed, i.e. based on the probability or likelihood that the branch that requires the data will be taken, and inserts a STOUCH instruction a prefetch point) determines; and

a cache manager for performing the at least one cache transaction if it is determined to be desirable.

23. With respect to claims 2, 19 and 36, the desirability of performing the at least one cache transaction is based on one of a frequency of access of at least one cachable entity (col. 13, lines 19 – 25, the cache transaction involves caching the replacing the old cached data with the prefetched data, the replacement strategy is based on the least recently used algorithm, i.e. least frequently used), a size of at least one cachable entity, a time to one of fetch and materialize at least one cachable entity, a lifetime of at least one cachable entity (LRU data is also the oldest data in the cache), and a combination thereof.

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

25. Claims 9 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cytron in view of Levine *et al.* (US Patent No. 6,073,129).

Cytron discloses all of the limitations of the parent claims as discussed above. However, Cytron does not specifically disclose the use of SQL code and that the code includes a SET statement. On the other hand Levine specifically discloses RDMS system that uses SQL codes including a SET statement (col. 29, line 57).

It would have been obvious to one of ordinary skill in the art, having the teachings of Cytron and Levine before him at the time the invention was made, to use the RDMS teachings of the computer system with caching of Levine in the computer system with caching of Cytron, in order to in apply Cytron's automatic management of programmable caching method in a practical and widely used real life application such as the one disclosed by Levine.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Woo H. Choi whose telephone number is (571) 272-4179. The examiner can normally be reached on M-F, 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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December 8, 2004


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